

Aeromodeller 2 - hydrogen airship concept

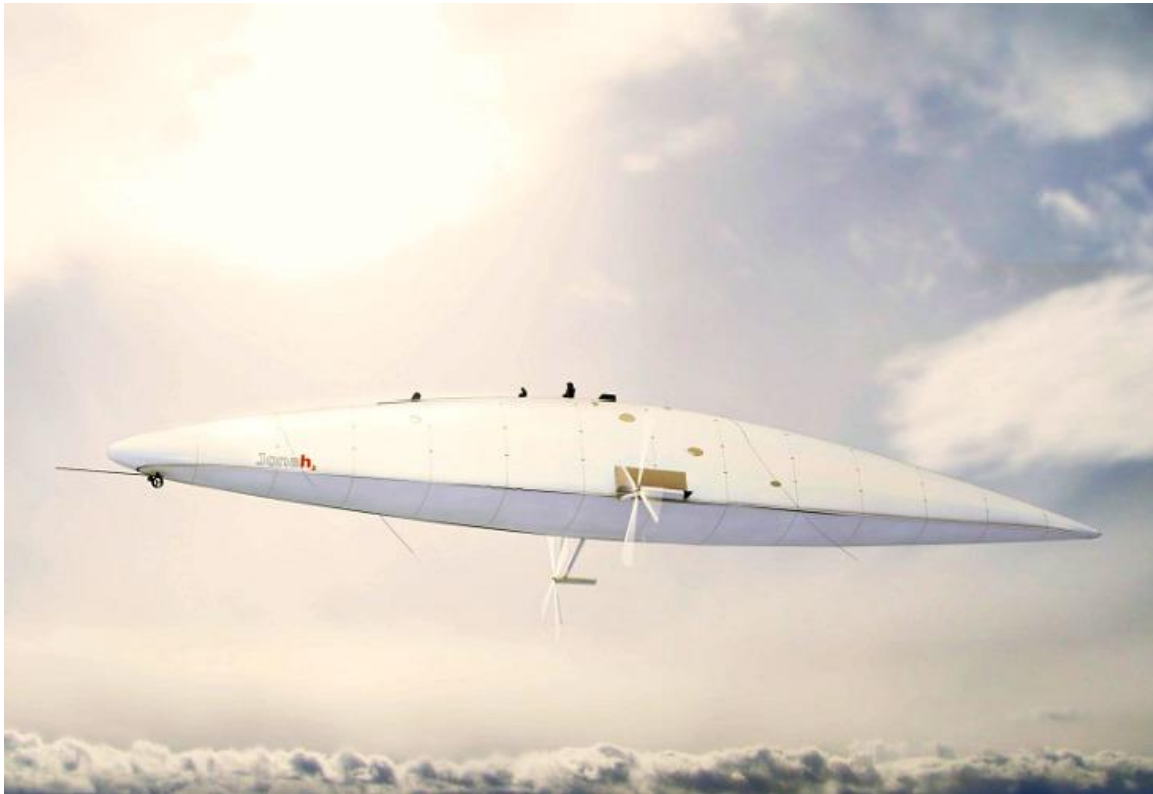
Peter Lobner, updated 8 February 2022

1. Introduction

This long, slender airship is a concept developed in 2011 by Belgian engineer Lieven Standaert for a zero-emissions airship that uses hydrogen for lift and fuel, and can generate hydrogen on-board using wind power so that it never needs to land. When the airship depletes its energy reserves (i.e., hydrogen available for producing power), the ship drops anchor and “rests” on its tether while it replenishes its hydrogen inventory by using wind power to generate the electricity needed to split (electrolyze) water to generate hydrogen. Standaert’s motivation for this project was to promote hydrogen as a clean fuel.

Standaert’s Aeromodeller 2 website is here:

http://aeromodeller2.hylas.be/?page_id=49

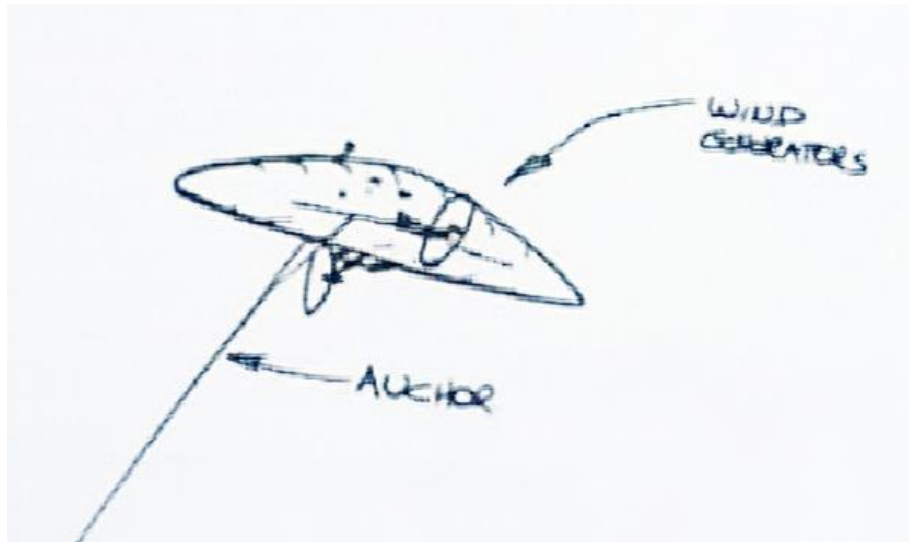


Rendering of Aeromodeller 2 in flight. Source: Inhabit.com

2. Aeromodeller 2 design and operation

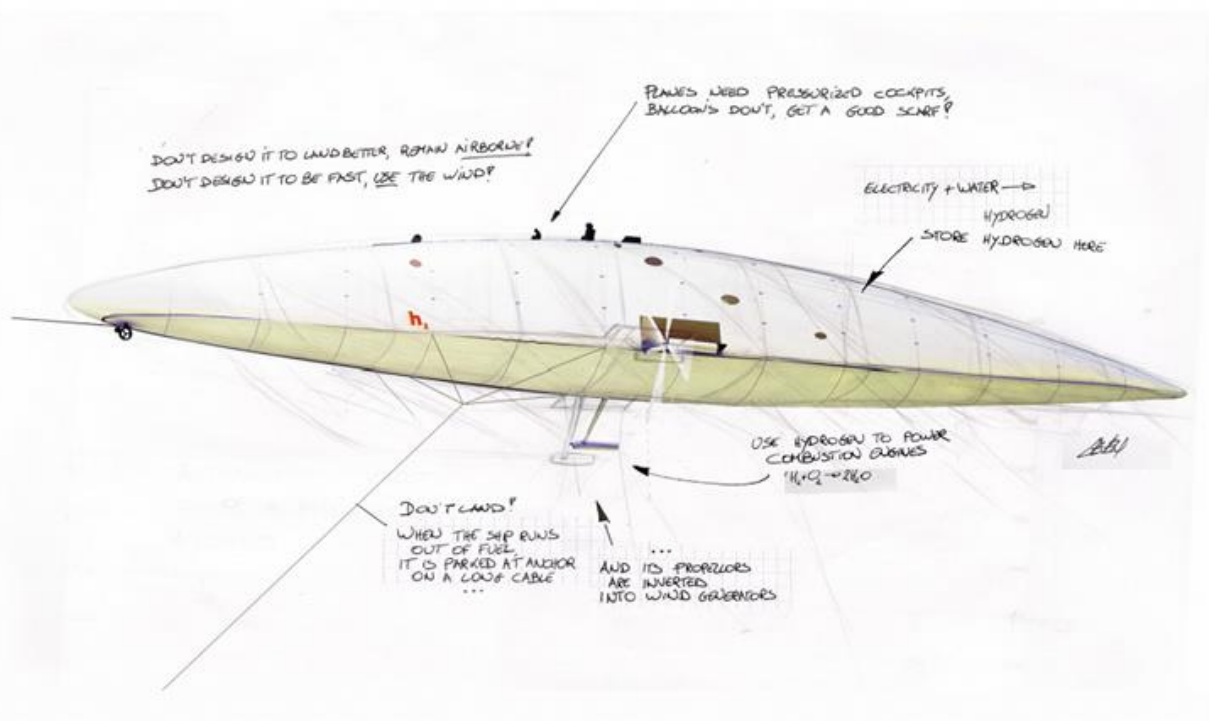
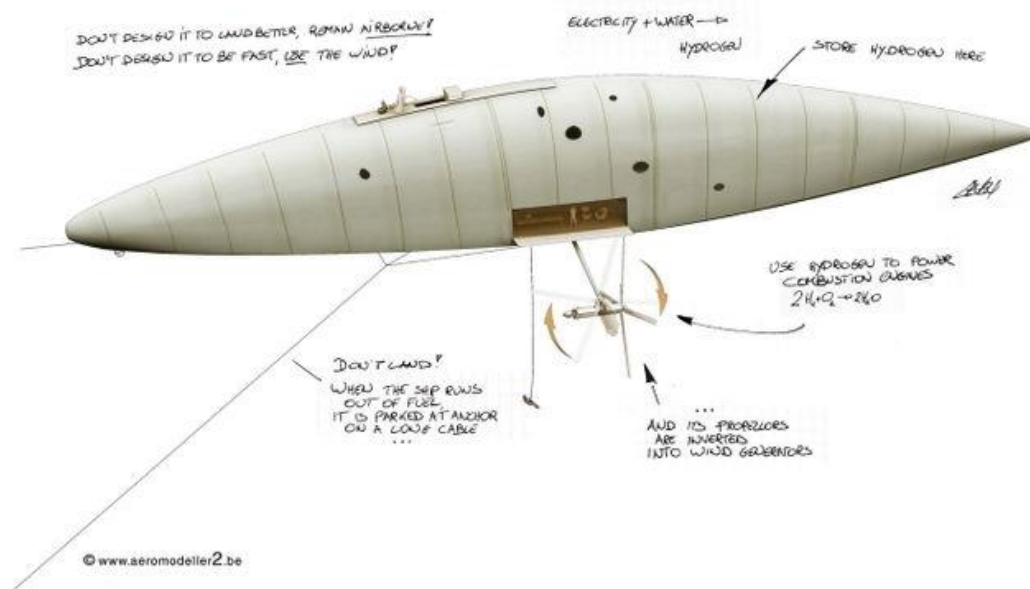
Aeromodeller 2 isn't designed for speed; its maximum speed would be about 80 kph (50 mph). This vehicle is designed to be completely zero-emissions, relying entirely on renewable energy from hydrogen produced on-board from the electrolysis of ballast water, which can be replenished by rain. The hydrogen is used as the lifting gas and as fuel for two 70 kW (94 shp) hydrogen combustion engine-generators that supply the hybrid electric power system.

Propellers are driven by two motor-generators, which operate as electric motors for propulsion or, when the airship is tethered by a ground anchor, as wind-powered generators to produce electric power for hydrogen production and to recharge a battery. The airship needs to periodically “rest” to replenish its hydrogen inventory. Six hours of wind energy can accumulate enough fuel from electrolysis for one hour of flight.

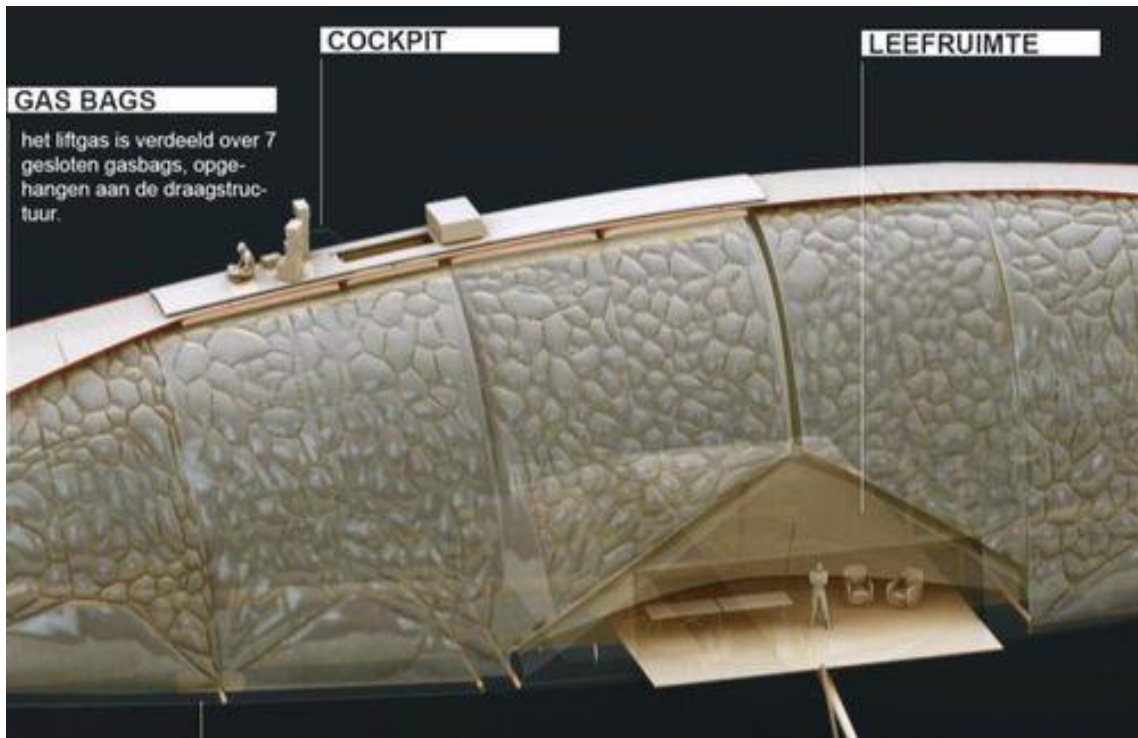


Ground anchor enables propellers to function as wind turbines for power generation. Source: Inhabit.com

Lower cost materials, like light thermoplastic foils, are proposed for the 85 meter (279 foot) aeroshell, instead of a woven, multi-layer fabric common in other airships. An articulated frame that runs along the bottom of the gas envelope supports the weight of the living quarters and the propulsion, electric power and electrolysis equipment.



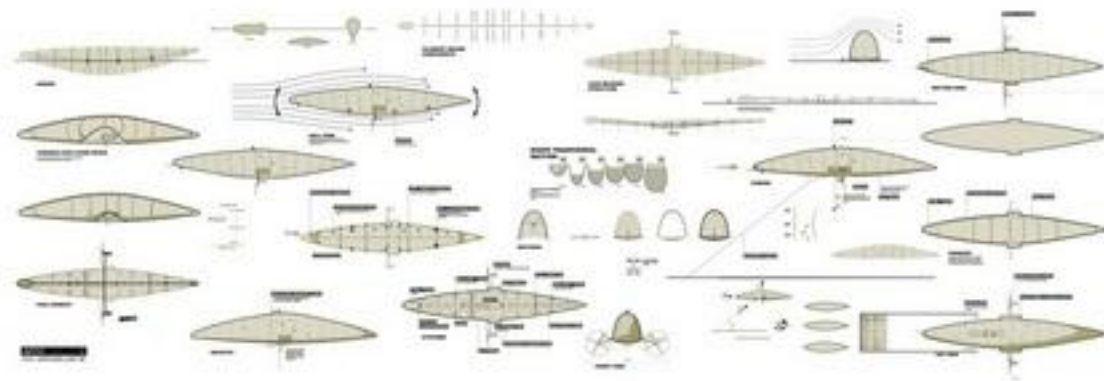
Aeromodeller 2 shown tethered, generating electrical energy for hydrogen production. Source: www.aeromodeller2.be



Details of the Aeromodeller 2 cockpit, lifting gas bags and the living area and terrace. Source: www.aeromodeller2.be

3. Testing and models

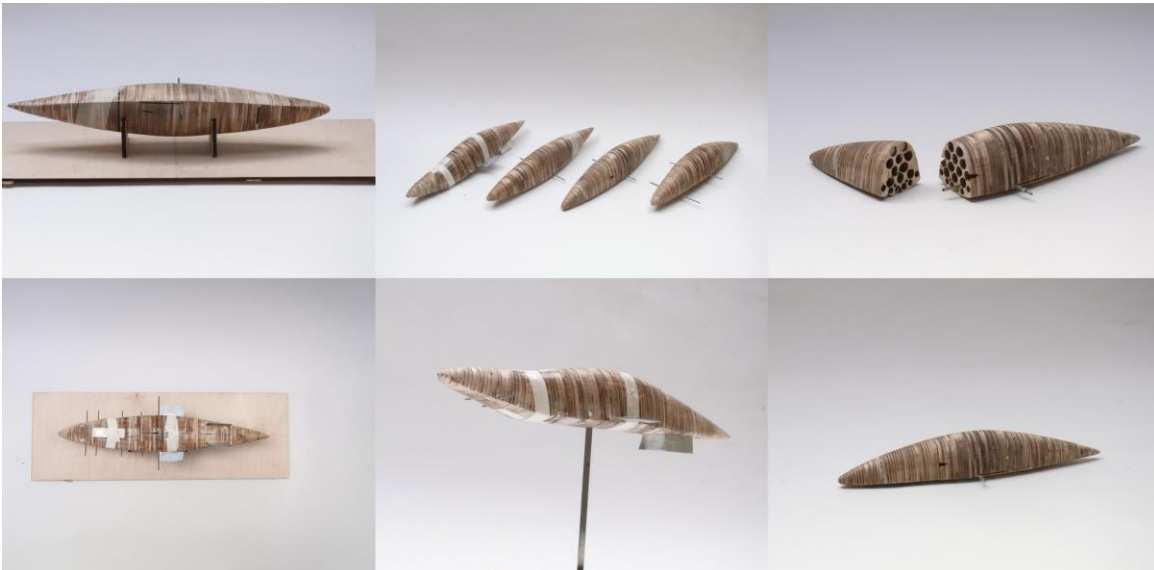
Standaert experimented with a range of shapes as he evolved his design for the Aeromodeller 2.



Standaert's CAD drawings show a range of Aeromodeller 2 shapes. Source: We Make Money Not Art (2011)



Standaert built a wind tunnel for testing Aeromodeller 2 shapes.



Collection of Aeromodeller 2 articulated shapes for wind tunnel testing. Source: www.aeromodeller2.be



*1/10th sub-scale (9-meter / 29.5 ft) model of Aeromodeller 2
on display in 2010 in Brussels, Belgium.
Source: www.aeromodeller2.be*

You'll can watch a short 2011 video of this Aeromodeller 2 model, showing the behavior of the articulated airframe, here:

<https://www.youtube.com/watch?v=cBqebW1MIUo>

4. Was there and Aeromodeller 1?

In fact, there was. Belgian artist Henri Van Herwegen, known by the pseudonym Panamarenko, was a prominent assemblagist sculptor who was best known for his fanciful aeronautical vehicle creations; none of which were intended to actually fly. His airship, known as The Aeromodeller, was a major exhibit at the Museum of Fine Arts (Museum voor Schone Kunsten, MSK) in Ghent in 1980 and again during a retrospective exhibit in 2019.

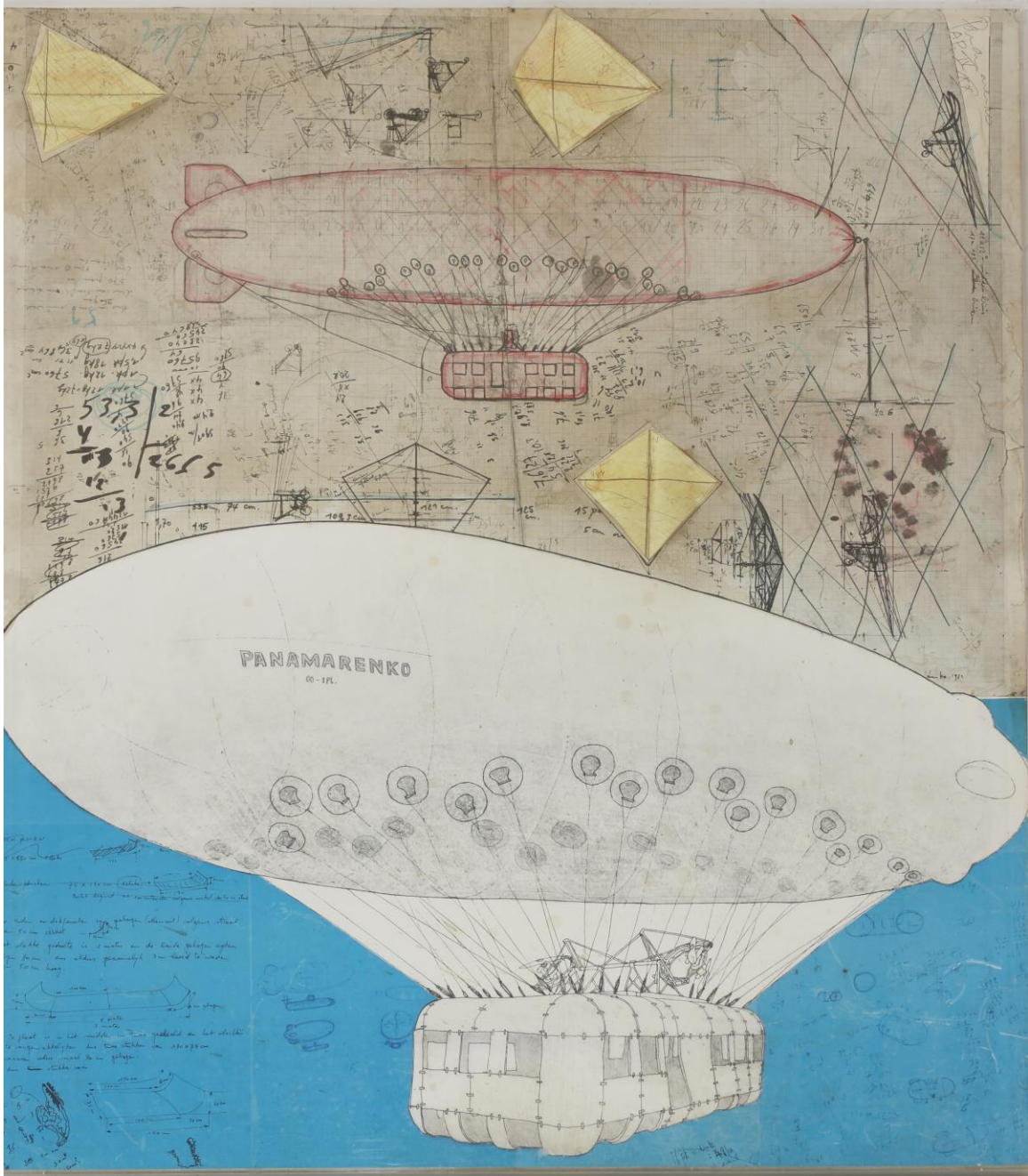
In a 2011 interview, Lieven Standaert commented on naming his airship the Aeromodeller 2 before its first exhibition in Antwerp, Panamarenko home town: "It was a bit a provocation, but mainly I wanted to affirm my love for his old work."



*Panamarenko's original Aeromodeler on display in 2008.
Source: We Make Money Not Art (2011)*



*Panamarenko's original Aeromodeler on display in 2019.
Source: MSK Ghent*



The Aeromodeller (1972) offset lithograph printed in colors with collage, by Panamarenko. Source: Mutualart.com

5. For more information

- “Camping in the clouds: the Aeromodeller II,” Low-Tech magazine, 2009: <https://www.lowtechmagazine.com/2009/02/gipsy-zeppelin-baseship.html>
- Bridgette Meinhold, “Hydrogen & Wind Powered Zeppelin Could Revolutionize Airship Transportation,” Inhabit, 19 January 2011: <https://inhabitat.com/hydrogen-wind-powered-zeppelin-could-revolutionize-airship-transportation/>
- Regine, “Aeromodeller 2,” We Make Money Not Art, 27 July 2011: <https://we-make-money-not-art.com/aeromodeller2/>

Videos

- Lieven Standaert’s YouTube channel, with many short videos on the Aeromodeller 2: <https://www.youtube.com/user/Aeromodeller2project#p/p>

Other *Modern Airships* articles

- *Modern Airships - Part 1*: <https://lynceans.org/all-posts/modern-airships-part-1/>
- *Modern Airships - Part 2*: <https://lynceans.org/all-posts/modern-airships-part-2/>
- *Modern Airships - Part 3*: <https://lynceans.org/all-posts/modern-airships-part-3/>